UNITED STATES DEPARTMENT OF ENERGY

OFFICE OF FOSSIL ENERGY

CARBON SEQUESTRATION PROGRAM

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

PUBLIC SCOPING MEETING

TAKEN ON TUESDAY, MAY 18, 2004

GREATER COLUMBUS CONVENTION CENTER

400 NORTH HIGH STREET

COLUMBUS, OHIO 43215

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TRANSCRIPT OF PROCEEDINGS

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MR. LORENZI: Let's begin the meeting.

This meeting was arranged by the U.S. Department of Energy as part of a process to obtain public participation in preparing a detailed environmental review in terms of an Environmental Impact Statement that will assist the Department of Energy in identifying and prioritizing issues, evaluating potential impacts, establishing a framework for environmental solutions and defining a program for future research, development and testing of technologies and methods for sequestration of carbon dioxide.

This is the second of eight meetings planned at various locations around the country for that purpose.

The carbon sequestration activities supported by the Department of Energy will help achieve the goals of the Global Climate Change Initiative announced by the President in 2002. That initiative will require both development of a portfolio of technology options with potential for reducing the carbon intensity of the U.S. economy, as well as establishment of the information base needed by the year 2012 for effective carbon sequestration decisions that balance economic

growth and investment in clean energy technologies.

The implementation of a carbon sequestration program to achieve those goals is the essence of the Department of Energy's action requiring preparation of an Environmental Impact Statement

Your input and comments, as well as input and comments that we receive from all these eight meetings, as well as through the end of the comment period on June 25th, will be an important part of our effort to prepare the Environmental Impact Statement. So, tonight, I thank you for your attendance.

My name is Lloyd Lorenzi and I'm an employee from the Department of Energy's laboratory in Pittsburgh, Pennsylvania. We have one other representative here tonight from the Department of Energy and he will introduce himself.

MR. KLARA: Thank you. I'm Scott Klara with the U.S. Department of Energy at the National Energy Technology Laboratory.

MR. LORENZI: Assisting the Department of Energy with preparation of the Environmental Impact Statement, as well as with the logistics of this meeting, is a team of environmental and administrative specialists led by Potomac-Hudson Engineering Company, and I would ask the representatives of the

Potomac-Hudson team represented here tonight to introduce themselves.

MR. CAREY: Good evening. My name is Fred Carey. I'm with Potomac-Hudson Engineering. I also have with me as part of our team Kevin Johnson with URS Corporation.

MR. LORENZI: We also have a court reporter here to prepare a transcript of this meeting, particularly of your comments, which we will use to document and identify views from the public regarding the desired scope and content of the environmental analysis that we will undertake.

At the entrance that was just outside the meeting room door we provided information regarding tonight's meeting, and that includes descriptions of the process that the Department of Energy will follow to prepare the DOE's Environmental Impact Statement, and also the Department of Energy's current activities and plans related to carbon sequestration studies.

We have also provided the registration sheet. I want to encourage you to sign the form as a record of your attendance at the meeting tonight, and we've also provided comment sheets that you can use tonight or following the meeting to submit written comments. But tonight we want to hear your oral comments on our

effort to prepare an environmental analysis on the carbon sequestration program, as well as on the program itself.

We will use those comments, as I said as well as any other comments received up to and including June 25th, to assist us in preparing the Environmental Impact Statement.

The draft of that Environmental Impact Statement is currently planned for completion or targeted for completion by the end of next summer and it would be made available for review and comment at the draft stage next summer before it's finalized, and the final version will probably be completed maybe in mid-2006.

Before we begin with your comments, Scott Klara with the Department of Energy will provide a summary of carbon sequestration activities. And in the microphone or if you don't need a microphone, just yell out, you will be provided the opportunity to provide comments. Scott.

MR. KLARA: Welcome everyone. We certainly appreciate your attendance in the evening after a hard day's work and very valuable to this process.

As I said a few minutes ago, I'm Scott Klara with the U.S. Department of Energy at the National

Energy Technology Laboratory, and what I'm going to do today at a very high level is discuss carbon sequestration activities within the Department of Energy, specifically within the Office of Fossil Energy of the DOE.

Here's an outline of the talk this evening, and I'm going to, again, keep it at a very high level.

I'm going to discuss some of the concepts of what carbon sequestration is, talk a little bit about both the fossil energy situation and the greenhouse gas implications from that, and then go into the sequestration program overview at a very high level, go over requirements and structure of the program, and then go over several key initiatives that are emerging within the Department that will likely in years to come resolve in field activities that will benefit from the Programmatic Environmental Impact Statement that we're going forward with.

I'll talk about what is carbon sequestration. To many, sequestration is an odd term that's difficult to understand. Many people like to refer to it as storage.

Essentially, what we mean is the capture and storage of CO2 and other greenhouse gases that would otherwise be emitted into the atmosphere. And the

importance here is you capture it both at a point source such as a large power plant, for example, or you can capture it via other methods. Typically terrestrial methods. Planting trees, for example, where you're capturing the CO2 out of the air but you really don't know where it came from. So those are the two general categories of capture that we have.

From a standpoint of storage, several location opportunities exist to store these greenhouse gases. Probably the front-running candidate for storage is what we call geologic storage, which is under the ground.

These typically deal with oil & gas reservoirs, a reservoir called saline reservoir where there's brackish saltwater and unmineable coal formations. And those are really the key geological sequestration options that are being pursued.

Some other options are also being considered. The dissolving of CO2 in the deep oceans or in the sediment beneath the ocean.

Right now no one is stating ocean sequestration is a real option. There are still many questions on the environmental side that have to be worked out. But because the ocean is the world's largest natural sink, right now we're really trying to

understand the mechanisms and looking at leverage and options that might increase CO2 dissolution in the ocean. And another reason for looking at the ocean as well as years from now, if the current rate of dissolution in the ocean changes, we want to have some good idea on understanding why that's occurring and what's happening to make that occur.

Another option is being able to convert CO2 to solid materials. You can with chemical reaction mechanisms convert CO2 to what's called carbonates, and these are rock-like minerals, mineral substances. And I have a prop that I've brought today of magnesium carbonate. This contains about 25 percent CO2 and this is locked into this solid material. This is one pathway that we're pursuing as an option to deal with CO2 sequestration.

And lastly, I mentioned just a few minutes ago, terrestrial sequestration where we're looking at reforestation, as well as enhanced agricultural practices that keep carbon stored in the soil and the plant life.

To give you a sense of what fossil energy means to the United States and the world, what I show here is two pie charts. The pie chart on the left shows the energy mix from fossil fuels and other energy

options for the United States and then on the right figure shows it for the world. And what you see here is that fossil energy accounts for about 86 percent of the energy needs in the United States and, coincidentally, in the world as well. So a key, key energy source.

What I want to show here is that was a picture from 2002. Now let's take a look at what we think is going to happen in the future.

What this lower left pie chart shows is the energy mix in 2002. And, again, it shows about the 86 percent use of fossil fuels. You can see it's divided there with oil at about 39, coal 23 and gas 24 percent of the total mix in 2002. And what we know is that when we go to the year 2025, nearly all projections are stating that these fossil fuels will remain at least at those levels. So we end up with 86 percent in 2002, up to 87 percent roughly stable in 2025. But the key here is we're going to use a lot more of this.

So right now when you have fossil fuels, they contain something called carbon. When you burn these fossil fuels, you produce CO2, which is a predominant greenhouse gas.

In 2002, we're burning it at these levels called 98 quadrillion BTUs per year. What we see in

2025 is now we're going to go up to 126 quadrillion BTU's per year.

What does that mean in terms of greenhouse gas emissions? We're going to be emitting much more CO2 based on these forecasts.

Let me now try to give you a sense of, well, what does this all potentially mean to climate change and what does it mean to CO2 concentrations in the atmosphere.

What this graph shows is the time scale over the last several hundred-thousand years. It shows both the temperature, which is the lower black line, and the CO2 concentration, which is the upper blue line.

Some messages I want you to take away from this chart. One is, for the last several hundred-thousand years temperature and CO2 concentrations have been tracking each other.

Then what you'll see is on the upper right side is you'll see this arrow that kind of goes straight up from the bottom level of 280 to a level of 370. That's what's happened over the last 150 years since the start of the Industrial Revolution.

So, CO2 concentrations have gone up 30 percent over the last 150 years. So, the concern and implications are, if CO2 concentrations and temperature

track so well for the last couple hundred-thousand years, what might happen in the future?

Another point to add from this slide is that right now we're looking at increasing the CO2 concentration at about 1.5 or so ppm per year, and that rate seems to be slightly increasing year by year. Next.

What this pie chart shows is the United States greenhouse gas emissions and a breakout from the various emission sources, and these are anthropogenic emission sources, which means human-induced.

What you see from this chart is that CO2 is the prominent greenhouse gases in the United States accounting for about 81 percent of the mix. You also see another component there called methane at 9 percent.

So those two, CO2, carbon dioxide and methane, are the key greenhouse gas in the United States, and this all translates to most developed countries in the world.

The point I want to make relative to the DOE program is the bulk focus of our R&D activities relate to CO2 from energy, mainly because of the implications of this pie. We do have a small part of our program that's focusing on the methane component and that

methane component deals with fugitive methane emissions from landfills, natural gas pipeline distribution systems, and underground coal mines, and we're developing some technologies that are able to deal with that.

This is another chart showing that all fossil fuels and energy sectors contribute CO2 emissions.

I want to point your attention to the bottom middle pie, which essentially shows that with the fossil fuel mix, 46 percent oil and then coal and national gas are close to 30 percent each. This gives a contribution.

The pie on the right-hand side I want to speak to as well, and it shows that when you divide it in terms of sector, you see that electricity contributes about 40 percent of the greenhouse gas emissions, transportation at 30 percent, 32 percent and then other.

From this slide, the research and development that we're pursuing in the program right now relate almost exclusively to coal at 30 percent and then the electricity sector at 40 percent. Because right now with coal, 90 percent of coal in the United States is used for power generation. Also, power generation represents a very nice opportunity where you have a

large source of CO2 that you can come in and capture and capture very large quantities.

So that's why coal and power generation, at least in our program and really throughout the world, are being looked at as the first options that we would pursue if we would need to capture large quantities of CO2.

When dealing with carbon management options it's often divided into three legs. Some people call this three legs of the stool, three corners of the pyramid. What you'll see is reduced carbon intensity.

These options are things like renewable energy: solar wind, nuclear, and fuel switching, switching from coal to some lower carbon-based fuel.

The middle section is improved efficiency and that could be both on the demand side, for example, improving the efficiency of cars and improving efficiency of refrigerators and things like that. And also on the supply side. Improving the efficiency that we produce and generate electricity in a power plant. And then the third option, which we're here to speak to in our program, is sequestering carbon. And as I mentioned earlier, that's capture and storage and also enhancing natural sinks.

A message to take away from here, and I'll

show you a little more detail later, is that all three of these options are critically necessary to deal with this issue. The issue is too large for any one option alone to handle it. And so as you'll see as we go forward in these next few slides, you truly need all of these options to deal with greenhouse gas emissions if we decide we're going to do something.

Next.

From the standpoint of the presidential direction that drives our R&D program there's really two key initiatives that have been mentioned over the last several years.

One is something called the National Climate Change Technology Initiative in June 11th of 2001. And the importance of this initiative was it was one of the first presidential statements under this Administration that talked about climate change as an issue, and also mentioned carbon sequestration as one of the key technology options that deal with this issue.

The second was the Global Climate Change Initiative on Valentine's Day of 2002. That was released the same day as something called the Clear Skies Initiative which dealt with criteria and pollutants, and hence this initiative probably didn't get as much press as it should have.

This was another presidential initiative that focused on greenhouse gas emissions and carbon sequestration, but more importantly, it puts some metrics on the United States. And what it did it said we want to reduce what is something called the greenhouse gas intensity by a certain amount over the next 10 years.

So within our program a lot of our technologies and technology mix that we're pursuing are related to dealing with this target specified by this Global Climate Change Initiative. Next.

One reason that sequestration gets so much hoopla is because of the large capacities that exist.

I'm going to show you in the next slide or two slides from now the significant quantity of emissions that we have in the United States and in the world.

Very few options exist that could make a big dent in these emissions but sequestration is one that can. And what this chart shows is on the right-hand side -- don't be too concerned with the numbers, the capacity side, but you'll see on the right-hand side Annual World Emissions. This number is at about 6.5 gigatons. 6.5 billion tons for the world emissions.

And then what you will see from these charts,

I don't know how well you can see it with this light, but you'll see a dark bar and then the upper part of the bar is more of a shade, and what that shows is the ranges that we believe exist right now for capacity of these storage options to handle CO2.

And the message to take away from this slide is, we believe even with conservative estimates that there's at least a century or more worth of capacity in sequestration. A century or more's worth of capacity, if not centuries. That is one reason why sequestration gets so much hoopla in the portfolio of approaches that we're pursuing related to greenhouse gases. Next.

What this chart shows is we've performed some analysis, as many organizations have, on if we were to look at the United States through the middle of the century and put a scenario together that says we want to stabilize emissions at some level, and so what we've done with this analysis we said let's try to stabilize emissions at 2002 levels in the United States.

What happens is you get this gap of emissions that by the year 2015 is 1,700 million metric tons of carbon in the year 2015.

Some messages from this slide: 1,700 million metric tons. Such a large number.

The American Electricity Power plant, they

have several power plants in your region, some of the largest in the country, will emit eight. So 1,700 is the gap we would have to make up. One large power plant is eight, just to show you the magnitude of those emissions.

And another message that this slide should show is -- this is our analysis. Many other analysis would show the same thing. -- is because of how large these emissions are, sequestration is going to have to bear the brunt of the emissions reduction at least 60 percent or more. And in this analysis, which sequestration is those top two options, followed by non-CO2 greenhouse gases, which are these fugitive methane emissions, followed by afforestation, agriculture and the bottom sentence is efficiency and renewables.

So, again, the message here is the emissions are so large that the options we have available to deal with them, sequestration is a very key option that has the capacity to meet these kind of reductions. Next.

What are our requirements for sequestration? Probably these are very obvious but certainly it has to be environmentally acceptable.

It can offer no legacy for future generations. It has to respect the ecosystems and, if

possible, improve ecosystems, for example, by planting trees.

It has to be safe. No hidden, sudden large discharges. And even seepage we're concerned about.

And so we're developing portfolios of technologies that are allowing us to be able to track the fate of the CO2 and if it does leak to be able to mitigate that leakage.

It's verifiable. Very important that we have the ability to verify the amount of CO2 sequestered.

If we're putting all of these millions to billions of tons of CO2 in the ground, for example, for geologic sequestration, we better be able to make sure what we're putting down there and account for it and make sure that it stays there. And the last one is economically viable.

There's research being pursued throughout the government and also throughout the Department of Energy, and what this slide is intended to show is within the Department we have something called the Climate Change Technology Program, which is this upper box, and it performs this coordinating function throughout the Department related to climate change activities and R&D.

Then there's an Office of Science Component,

which is, I guess, on your lower right box. That's where more of the fundamental, basic research occurs within the Department. The research that really doesn't have a use yet and we don't know that it will have a use. And that's where a lot of that Office of Science work is just looking at the fundamental basics of what's going on.

Where this program resides is in this lower left box called the Office of Fossil Energy and Applied R&D. And the reason that we're coming forward and wanting to go through a Programmatic Environmental Impact Statement is that we're really the group that's looking at the R&D that's headed toward near term and future deployment.

So we're really the ones that are developing the technology that's going to be getting out there, and if there are environmental implications, having to manage those and deal with those. Next.

Here's another slide that shows a bunch of agency activities throughout the government. Everything from NASA to the geologic survey NOAA and, et cetera.

I just want to show two examples of this, that we try very hard to coordinate these activities throughout the government. It's a very challenging

task. But some examples. For example, EPA, Environmental Protection Agency, is a lead agency for these non-CO2 greenhouse gases, these fugitive methane gases. The program that we have helps to support and work with the EPA on some of that activity.

The lower box here is the United States Department of Agriculture. They look at terrestrial sequestration. No-till farming, activities that leave more carbon in the ground. We also work hand-in-hand with many of those activities.

So this is just kind of a snapshot of all the different government activities that exist just to let you know it's being looked at from a very broad perspective. Next slide.

This slide it's about the depth of our program. This larger bubble on the left shows the core R&D program. It's divided into these three large categories: capture, sequestration, break-through concepts, non-CO2 greenhouse gases, which are these fugitive methane emissions, and measurement, monitoring and verification. That's a term we use that develops technologies, tracks the fate and permanence of the CO2 of the greenhouse gases. Then we have two larger initiatives that I'm going to speak to in the remaining slides.

One is called the Regional Partners dealing with infrastructure, I'll address that in more detail soon, and another is called FutureGen, which is our large-scale field test activity.

About a year -- well, probably about eight months ago now we established what we call Regional Carbon Sequestration Partnerships throughout the United States. We established seven of these partners.

You have a partnership in this area called the Midwest Partnership. Some of the partners are here this evening. And what this slide shows is that we encompass right now 154 organizations, two Canadian provinces, three Indian nations and right now 40 states. We have a gap in the northeast area of the country. Not really a surprise in the northeast area of the country. There's not real large geologic sinks available for sequestration and so much less interest in the sequestration concept in that region of the country. Next.

What are these partnerships about? Essentially, helping to develop what I call the infrastructure for wide-scale deployment.

The fact is that if we had technologies today that were cost-effective and environmentally benign, we couldn't deploy them tomorrow.

Some of the reasons we couldn't deploy them tomorrow is base-lining regions for sources and sinks.

We have nice, broad maps of the country that show where these geologic formations are, but the reality is most of those formations are unproven. Some parts of those formations won't be suitable sinks, and we don't have a good grasp yet of the proven versus unproven regions.

Addressing the regulatory environmental outreach issues. Right now if you say you want to put a sequestration project into play, nobody even has a clue yet what regulations would apply to that.

Establish monitoring and verification protocols. Within this program we can develop a lot of the instrumentation and tools that allow you to take a snapshot of a geologic formation and look at the C02.

What this program can't do is deal with more of the subjective decisions. For example, how often do you take a picture of the reservoir? Are you required to take it once a day, once a week, once a month?

If you plant a tree, do you have a forester go out and test it once a month, once every six months?

That's some of the issues where we mean they're establishing those protocols.

Validating some of these technologies and

infrastructure. Once we have methods for some of the above issues, let's go out and test them, see if they work, find out how we need to tweak them.

And the last thing is determining benefits of sequestration to a region. You might think, well, what are some of the benefits to a region. Well, it turns out that you can put CO2 in the ground to enhance oil recovery, you can put CO2 in the ground to enhance methane recovery.

In some states they even have unique situations, New Mexico, for example, where they're so desperate for water and in some regions they're looking to produce this brackish water from these saline formations and clean it up for drinking water. Well, what that does is it adds hugh capacities to that reservoir for CO2, and CO2 could also be used for a driving fluid to produce the water.

So all kinds of synergistic benefits can and likely accrue if sequestration gets to large-scale deployment in various regions. Next.

Last, I'd like to just mention our FutureGen initiative, a very key initiative within the Department.

We're looking to build a billion-dollar test facility, and this test facility will use

state-of-the-art coal technology to produce electricity and hydrogen from coal.

We're looking to evaluate and test our technologies that will show that you can use coal and emit virtually no air pollution, including greenhouse gases.

The greenhouse gas of interest will be to capture and permanently sequester CO2. We're looking into geologic formation as the storage point for this FutureGen project.

I'd like to end the presentation with some information sources. I'd just like to state that I kept this at a very high level for this meeting because of the diverse audiences that are expected for this effort, but I just want to let you know that all kind of resources are available, including people and websites, that contain all kind of detailed information and helpful information if you're interested.

This just shows the website for the Carbon Sequestration Program, which you can find at the weblinks shown there, www.netl.doe.gov. Next.

You have this in your packets of information. We also offer a free electronic subscription to a Carbon Sequestration newsletter that comes out roughly monthly, and you can join that electronically through

the website or through the link mentioned in your package on this page and free of charge.

As long as you have an e-mail address, you'll be able to receive this on a monthly basis, which does a very good job of showing highlights that occur throughout the United States and the world relative to sequestration concepts. And with that, that ends my portion of the presentation.

MR. LORENZI: We have six people who have signed up to make comments tonight as of a few minutes ago.

MR. KLARA: And we're not confined to those six. So if others would have comments, please feel welcome.

MR. LORENZI: We'll take them in the order that they registered outside the door, and we will ask the commentors to at least initially try to limit the extent of their comments to about five minutes, which was about the length of my opening remarks. And if you need more time, that will be offered. But we'll go through the list of registered individuals and then if any others want to make comments, they will be offered the opportunity to do so.

We ask that you do state your name and spell your name for the benefit of the court reporter and

indicate an organizational affiliation as you're making comments on behalf of an organization.

The first person who registered is Kurt Waltzer.

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MR. WALTZER: Thank you. I am Kurt Waltzer, K-U-R-T W-A-L-T-Z-E-R. I'm making comments on behalf of the Ohio Environmental Council.

The Ohio Environmental Council is a statewide network of environmental organizations in Ohio, and we are actually a partner in the Midwest Partnership. We're going to be submitting written comments, but I wanted to make three brief oral comments.

First, the reason we're participating in the partnership in our support of carbon sequestration research is because we believe it is not sufficient but absolutely necessary to address climate stabilization in a state like Ohio.

We believe the ultimate solutions are going to include renewable energy, energy efficiency, and all types of carbon sequestration. So we're very supportive of moving forward on this research.

My second point is we appreciate the opportunity to comment on the development of an Environmental Impact Statement. Because we're in an

environmental organization, we care about the environmental issues relating to carbon sequestration at all levels. So we want to be diligent to ensure that every aspect of our environment and public health are protected as we're moving forward on this technology.

And, third, I want to encourage the continuation even beyond the end of the comment period of including or stimulating a public dialogue on this issue.

Again, creating a dialogue before members of the public isn't going to be sufficient to move forward in creating additional research in carbon sequestration but it is going to be absolutely necessary.

If there is going to be public support for this type of process, people have got to be able to understand it, they've got to be able to participate in helping create it and bring their ideas to the table.

Those are my comments. And, again, we'll be submitting written comments before the end of the comment period.

MR. LORENZI: Thank you very much.

Mike Mudd.

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MR. MUDD: My name is Mike Mudd, M-U-D-D. I'm

Manager of Generation Technologies for American Electric Power.

I'd like to just summarize my comments and give to you the written comments.

I want to speak out and give a full endorsement of the DOE's carbon management program.

Coal is important to our country and to the State of Ohio, and we truly endorse any R&D that can reduce the carbon emissions associated with the burning of coal.

For the sake of time, I won't go into more detail now but other than to speak in favor of any of the efforts that the Department of Energy is doing with respect to this. And with that I will give my written comments for the sake of time tonight. Thank you.

MR. LORENZI: The third person registered to speak is Klaus Lambeck.

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MR. LAMBECK: Thank you. My name is Klaus Lambeck, L-A-M-B-E-C-K. I'm Chief of the Public Utilities Commission, Division of Facilities, Siting and Environmental Analysis, and I'm also a Staff Member of the Ohio Power Siting Board.

To keep it in line with everybody else, I will keep my suggestions or my comments short. I have

submitted written comments for the record.

Basically, there were four questions or four points before us. Let me concentrate on three of them and that is from a siting perspective, not just from a corporate/state local perspective, I would encourage the Department to continue to provide support for regional efforts in the development of energy for infrastructure. Not just for carbon sequestration R&D but infrastructure development at large. Transmission distribution aside from generation does play a hugh role.

That leads into the next point and that is technology development such as FutureGen, which for this region and many other regions that have the abundance of coal as their fuel resource available and are close to load is very, very important, and some fuel-specific applications should be explored in those regions.

In essence, some technology deployment based on coal characteristics specifically and use that as the basin for economic development and economic and technology analysis to come to a sensible solution to some of our infrastructure needs as were demonstrated in our recent blackout, which we I guess in Ohio are being kind of, sort of blamed for.

The funding for the technology deployment, and I am stressing the word "deployment," not just R&D, which is essential and should not take away -- deployment should not take away from the basis of fundamental R&D in this area, but we do need to re-emphasize and explore incentives that are based on the three-prong federal/state/industry effort.

The State of Ohio has a rich history of supporting R&D. The P.U.C.O. has never turned down any request by any of its regulated utilities that came before us for rate treatment of R&D projects, and I don't foresee any time in the future that we would not do such a thing in the future.

Thank you.

MR. LORENZI: Thanks, Klaus.

All comments will, of course, be documented for this E.I.S. development effort. Some comments may be just documented and really not addressed if they go beyond the issues that relate specifically to the E.I.S. effort. But they certainly will be made known, they will be made public, and if there are portions of those comments that are relevant to the P.E.I.S., this is the Programmatic Environmental Impact Statement, they will be covered and analyzed in the doctrine.

So, I appreciate your comments but recognize

that some of them may go beyond the scope of what we are doing on this particular effort, but we will do our best to document them and publish them and analyze what we can.

Jackie Bird was the fourth person registered to speak.

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MS. BIRD: Good evening. Keeping with the 90-second testimony rule that everyone seems to have established, I'm going to truncate this quite a bit.

My name is Jackie Bird, B-I-R-D. I'm the Director of the Ohio Coal Development Office within the Ohio Air Quality Development Authority. I'm going to cut to the chase on some of this and submit the written portion afterwards.

Ohio is often pointed to as part of the problem when emissions from coal-based plants are discussed. What was seldom pointed out is that Ohio is also part of the solution and has over the last two decades put its money where its mouth is and supported one of the largest state coal R&D programs in the nation, and along the way engaged in many fruitful project partnerships with USDOE, which we hope to continue in the future.

Ohio is proud to be in the vanguard again.

Over the last several years, Ohio has co-sponsored 27 CO2 R&D projects ranging from lab to field efforts.

Ohio has committed nearly $3 million towards these efforts, and I am pleased to note that USDOE has partnered with us on several of these, contributing a similar amount. The grantees have added another approximately $2.2 million.

With this backdrop, OCDO wishes to note that it supports the concepts of the USDOE's carbon sequestration program and urges you to proceed.

A few generic comments:

Since CO2 is a global issue, it is quite appropriate that an international venue such as the Carbon Sequestration Leadership Forum be pursued. There will not be true success of anything developed from this R&D program until it is deployed many times over, not just in the U.S. but throughout the world. A venue for the world to participate and contribute is most appropriate.

Each region of the US has its own generic advantages and disadvantages regarding CO2 sequestration. For this reason, OCDO supports the concept of the Regional Partnerships. We are also proud to note that we are a significant co-funder of the Midwest Carbon Sequestration Partnership, one of

seven such partnerships selected last year by USDOE.

This partnership is the largest and most ambitious of the seven, and we expect good things to come from this, which should be concomitantly served to lay a good basis for some of the issues associated with the proposed FutureGen plant.

Yes, OCDO supports the concept of a full-scale sequestration demonstration project that will capture and store carbon emissions among other goals, which is known as the FutureGen program. In fact, we endorse it to such an extent that Ohio is enthusiastically supporting the siting of the prototype FutureGen plant here in Ohio.

Ohio has all of the advantages such a program requires: The coal, the geology, the waterways and water resources, the bulk materials, transportation, infrastructure, a second-to-none work force, a university system with a very strong coal R&D expertise, the nations (which de facto means the world's) best power siting process, a state EPA familiar with coal plants, state programs devoted to coal R&D and clean air, and the ability to offer both funding and tax incentives for such a project.

We support the concept of a FutureGen plant and we support its becoming a reality through its

siting here in Ohio.

USDOE is correct that there is seldom a silver bullet for a matter as dynamic as CO2 sequestration, and therefore, we support a carbon sequestration core R&D program that will develop the portfolio of technologies for different techniques such as terrestrial, geologic and oceanic sequestration.

From Ohio's point of view, we are most interested in the first of these. However, we do inject a few notes of caution.

While Ohio supports all of the above, it also strongly reiterates the need for USDOE's basic coal R&D program. Many of the antecedents to FutureGen are presently found in the base coal R&D program. Just one example is the Ultra Super Critical Materials Consortium, which OCDO is co-funding along with USDOE. These pieces of research are absolutely necessary for the eventual success and deployment of a FutureGen plant. Do not budgetarily rob Peter to pay Paul.

Gutting funds from the base coal R&D program to fund FutureGen is counterproductive. One cannot expect to succeed in college if he's not learned his necessary lessons in grades 1 through 12.

Remember the existing coal fleet. It is not going to go away anytime soon and it still has issues

that need to be addressed. Some funding should be allocated for concerns associated with combustion facilities.

Remember the smaller units. We are getting an increasing number of calls from small generators who want to environmentally upgrade the mid- and small-size units.

Interestingly, with the increasing up tick in the price of natural gas, we are also getting interest in those who would like to go back to coal. Consider them in your overall programs as well.

Thank you for your time and attention to these matters.

MR. LORENZI: Thank you for your comments.

A wide range of issues which people in the Department of Energy are well aware of. I might just mention one thing about the FutureGen project.

Scott mentioned FutureGen, Jackie Bird mentioned FutureGen. The FutureGen project is really on a separate pathway of implementation, and this particular Environmental Impact Statement will not address FutureGen development effort. There will be plans to develop a separate E.I.S. that deals with all of the issues related to FutureGen: technological, sequestration, site location. But thank you for your

comments.

MS. BIRD: May I add one P.S.?

MR. LORENZI: You may, yes.

MS. BIRD: On monitoring and verification, please keep that simple. If it ends up like the IRS Tax Code, no one will use it and the program will be less than successful.

MR. LORENZI: Thank you.

Are these the extent of your written comments?

MS. BIRD: Yes, those are them.

MR. LORENZI: Okay. The next individual requested to speak is Elizabeth Shaw.

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MS. SHAW: Good evening. I'm a little shorter than some of the other people here. My name is Elizabeth Shaw, S-H-A-W. I am the Manager for Energy Supply Technologies for FirstEnergy. And in keeping with everybody else, I'm going to kind of abbreviate my comments. I did leave a copy with the staff person at the table, so my comments have been provided already.

FirstEnergy owns and operates 20 power plants. We have a combined capacity of over 13,000 megawatts of electricity. About 55 percent of that capacity is coal. And so while we do have nuclear, we

do have hydro, and we do have natural gas, coal is a significant part of our portfolio. And so even though we're diversified, we think that solving the environmental issues around coal is very important to us.

We've already spent significant amounts of money since the Clean Air Act was passed to address environmental concerns and achieve significant reductions, and so we support the efforts of DOE to try to address the global climate change emissions.

Achieving meaningful reductions of carbon dioxide will require a combined approach, including cost-effective control technologies, increased fuel efficiency, lower emitting and renewable sources, advanced electro-technologies, terrestrial sequestration through tree planting and other land management efforts, geological sequestration, and a market-based training program.

We think all of those different facets are necessary to address these tremendous issues.

We support the efforts of USDOE to understand the potential benefits and costs of carbon capture and sequestration, and we think that the effort of DOE will be important to develop a meaningful reduction strategy for this nation.

We believe that any policies designed to address the global climate change issue should, number one, provide flexibility in meeting emission reduction goals; should also include reasonable compliance schedules to encourage the development of realistic, cost-effective control technologies and energy-efficient electro-technologies; should also be applied across a broad geographic region, recognizing that climate change is a global issue; should provide incentives for technological developments; and should also recognize and allow the registration for early actions that have already been taken.

We at FirstEnergy have taken a significant number of steps over the last 10 or 11 years to reduce our global climate change emissions and we would like for those actions to be recognized.

We encourage the Department of Energy to continue its work to develop cost-effective, commercially ready and environmentally sound technology options to reduce greenhouse gases.

We believe that major technological advances are needed to achieve the reduction of the goal of stabilizing CO2 levels. The concerted, collaborative efforts of the DOE and other stakeholders are vital to meeting that goal.

We did review the Programmatic Environmental Impact Statement as described in the Federal Register Notice of Intent and we agree with all of the things that have been detailed. We would recommend one additional item to be considered.

We would recommend that the PEIS also include the potential socioeconomic impacts of the increased cost of energy as a result of CO2 capture and sequestration.

We are confident that a reasonable climate change policy, one that includes thorough economic, scientific and environmental review, can be achieved through the type of public-private partnerships that the DOE has initiated with this carbon sequestration program.

The rest of my comments are in detail. They are in the written submittal that I provided, and we may be providing more comments before the deadline. Thank you for the opportunity to comment.

MR. LORENZI: Thank you for providing your comments.

One question. The written comments, are they out front?

MS. SHAW: I placed them in the box.

MR. LORENZI: Okay. That's fine.

MS. SHAW: The staff person that was out there took them, yes.

MR. LORENZI: Thank you very much and I appreciate your comments on that. Those were very good comments and we appreciate it.

MS. SHAW: Thank you.

MR. LORENZI: The final registered person is Rattan Lal, L-A-L.

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MR. LAL: Mr. Chairman, my name is Rattan Lal, L-A-l, Professor of Soil Science and Director of the Carbon Management Sequestration Center at Ohio State.

I endorse very strongly the carbon sequestration program that the DOE and NETL has, and I especially endorse the work that they are doing on terrestrial carbon sequestration through the partnerships that were mentioned here.

I would like to mention that restoration of degraded soils in ecosystems, including mine soils, which are a very important activity in Ohio in our partnership region, is a very important strategy of carbon sequestration.

In the United States the terrestrial ecosystems of agricultural soils lost somewhere about 5 billion tons of carbon since the settlement of

agriculture about 200 years ago, compared to the global loss of about 80 billion tons, and we have the potential to sequester that carbon through restoration and management of the agricultural soils. And some of the activities funded by the programs such as the one we're talking about have estimated that in Ohio the potential for terrestrial carbon sequestration is about 10 million metric tons of carbon a year.

In the United States the potential for terrestrial carbon sequestration in soils is about 300 million metric tons of carbon a year and in the world it's about one billion tons of carbon per year. This potential can be achieved somewhere in 25 to 50 years.

For the 300 million tons of carbon sequestration potential for the United States at present only 20 million tons is being realized. So we have a lot of opportunity to achieve that.

There were several questions raised here, and I think Jackie Bird talked about monitoring and verification should be simple, and I fully support that. And I think terrestrial carbon sequestration could be as simple as to evaluate the land use. Because we can tie the carbon sequestrational rate and assessment to simply knowing what land use and what practices are being followed.

Another important part of this is they should be safe and environmentally friendly as one speaker mentioned that.

This practice of terrestrial carbon sequestration is not only safe, it is absolutely necessary to be able to feed six billion people of the world now, and perhaps 10 billion 50 years from now.

Thank you, Mr. Chairman.

MR. LORENZI: Thank you very much.

Are there other individuals who would like to make comments tonight about the sequestration program or the development of this Environmental Impact Statement?

Don't be bashful. This is a good opportunity to provide oral comments. However, if you choose not to tonight, you can provide comments up until the June 25th cutoff date, but we would encourage you to take advantage of this opportunity tonight.

No one is desiring to speak. In that case, I'll just remind you again, June 25th is the cutoff date, and with that final comment we'll draw this meeting to a close.

I wish you all safe travel back to your residence and, hopefully, it will be dry outside. I thank you very much for your participation, and at

8:00 by my watch we'll call the meeting to a close. Thank you.

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Thereupon, at 8:00 p.m., on Tuesday, May 18, 2004, the public hearing was concluded.

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CERTIFICATE

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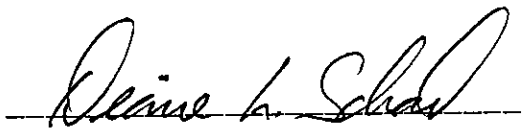
I do hereby certify that the foregoing is a true and correct transcript of the proceedings in this matter on Tuesday, May 18, 2004, taken by me and transcribed from my stenographic notes.



Diane L. Schad, Court Reporter.

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